

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P019113WO	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/GB99/01350	International filing date (day/month/year) 30/04/1999	Priority date (day/month/year) 30/04/1998
International Patent Classification (IPC) or national classification and IPC C12N15/12		
Applicant IMPERIAL COLLEGE INNOVATIONS LIMITED et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 6 sheets, including this cover sheet.

- ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 29/11/1999	Date of completion of this report 07.07.2000
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Herrmann, K Telephone No. +49 89 2399 2670 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/GB99/01350

I. Basis of the report

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

Description, pages:

1-21 as originally filed

Claims, No.:

1-28 as originally filed

Drawings, sheets:

1/18-18/18 as originally filed

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

- ☐ the entire international application.
☒ claims Nos. 1, 2-4 (partially), 8-28 (completely).

because:

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- ☒ the said international application, or the said claims Nos. 2-4 (with respect to industrial applicability) relate to the following subject matter which does not require an international preliminary examination (*specify*):

see separate sheet

- ☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):
- ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.
- ☒ no international search report has been established for the said claims Nos. 1, 2 (partially), 8-28 (completely).

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims 4, 6, 7
	No:	Claims 1-3, 5
Inventive step (IS)	Yes:	Claims
	No:	Claims 1-7
Industrial applicability (IA)	Yes:	Claims 1, 5-7
	No:	Claims

2. Citations and explanations

see separate sheet

Citations

The documents mentioned in this International Preliminary Examination Report (IPER) are numbered as in the International Search Report dated 18.11.99, i.e. **D1** and **D3** correspond to the first and the last document of the search report, respectively.

Re ITEM III (Non-establishment of opinion)

- 1 The International Preliminary Examining Authority (IPEA) agrees with the objection put forward by the International Searching Authority (ISA) as to lack of unity (Rule 13 PCT) and considers that the present application relates to 3 inventions.

In response to an invitation, the Applicant did not pay additional search fees. Consequently, international search and preliminary examination have been restricted to the subject-matter of claims 1 and 2 (partially) and claims 3-7 (completely) which the ISA identified as invention 1.

- 2 Claims 2-4 relate to subject-matter considered by this Authority to be covered by the provisions of Rule 67.1(iv) PCT (*in vivo* treatment or diagnostic methods on the human or animal body). Consequently, no opinion will be formulated with respect to the industrial applicability of the subject-matter of these claims (Art. 34(4)(a)(i) PCT).

For the assessment of the present claims 2-4 on the question whether they are industrially applicable, no unified criteria exist among the PCT Contracting States. The patentability can also be dependent upon the formulation of the claims. The EPO, for example, does not recognize as industrially applicable the subject-matter of claims to the use of a compound in medical treatment, but will allow, however, claims to a known compound for first use in medical treatment and the use of such a compound for the manufacture of a medicament for a new medical treatment.

Re ITEM V (Novelty, inventive step, industrial applicability)

1 Novelty (Art. 33(2) PCT)

- 1.1 The subject-matter of claims 4, 6 and 7 has not been made available to the public by any of the available prior art documents and can therefore be regarded as novel.
- 1.2 The subject-matter of claims 1-3 and 5 does not meet the requirements of Art. 33(2) and 33(3) PCT.
- 1.3 **D1** discloses a soluble fusion protein of human CTLA-4 and the immunoglobulin (Ig) G1 Fc region. Said soluble fusion protein (CTLA4Ig) binds to human and murine B7 with high avidity, blocks human pancreatic islet rejection in mice (T cell activation) and induces long-term, donor-specific tolerance (see abstract of **D1**).

Thus, the subject-matter of claims 1-3 and 5 cannot be regarded as novel in view of **D1** (Art. 33(2) and (3) PCT). Similar results have been disclosed in **D2** and **D3** which therefore also deprive claims 1-3 and 5 of novelty.

2 Inventive step (Art. 33(3) PCT)

The subject-matter of claims 4, 6 and 7 does not meet the requirements of Art. 33(3) EPC.

The closest prior art concerning claims 4, 6 and 7 is **D1**. **D1** discloses a soluble form of human CTLA-4 designated human CTLA4Ig. This molecule was used to block human pancreatic islet rejection in mice. **D1** differs from the present application in that human CTLA-4 was used instead of porcine CTLA-4. The technical problem to be solved by present application can therefore be seen in the provision of molecules which block the rejection of donor organs from other species.

The use of porcine organs for xenotransplantation is widely favoured in the art. Therefore, the IPEA is of the opinion that the skilled person, using the general

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technical knowledge concerning the properties of human soluble CTLA4Ig, would arrive at a porcine CTLA-4 and use it in the manner described in **D1**, without the exercise of inventive skill. Consequently, the IPEA is of the opinion that the subject-matter of claims 4, 6 and 7 does not meet the requirements of Art. 33(3) PCT.

4 Industrial applicability (Art. 33(4) PCT)

Claims 1 and 5-7 meet the criteria as set forth by Art. 33(4) PCT.